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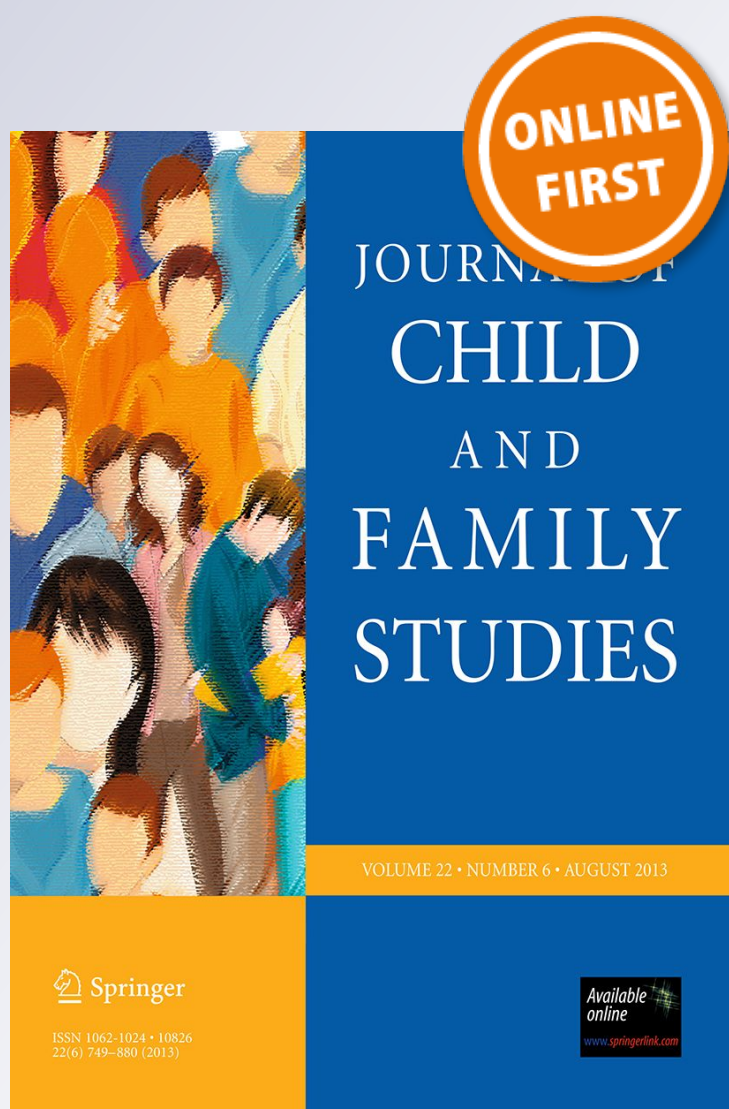
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Prospective Associations between Aggression/Bullying and Adjustment in Preschool: Is General Aggression Different from Bullying Behavior?

Jamie M. Ostrov¹ · Kimberly E. Kamper-DeMarco¹ · Sarah J. Blakely-McClure¹ · Kristin J. Perry¹ · Lauren Mutignani¹

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Abstract

In the current paper, two short-term longitudinal studies were conducted to examine relational aggression and relational bullying as differential predictors of relational victimization and health-related outcomes (i.e., social maladjustment problems). In Study 1, teachers completed reports of preschoolers' ($N = 124$; M age = 44.88 months; $SD = 4.52$; 41.1% girls) physical and relational aggression, bullying behavior, and peer victimization at two time points. Hierarchical models revealed that, consistent with study hypotheses, relational aggression but not relational bullying predicted increases in relational victimization. Study 2 ($N = 105$; M age = 46.78 months; $SD = 7.47$; 52.4% girls) improved upon several limitations of Study 1 by having multiple informants and addressing collinearity concerns. Specifically, two variables were created, relational severity and relational directionality, reflecting the commonalities and differences between relational aggression and relational bullying respectively. Results of Study 2 generally replicated the overall pattern of findings of Study 1 with a more conservative model. Results indicated that relational directionality tended to be negatively associated with increases in social maladjustment problems. These results suggest that, relative to relational bullying, relational aggression tended to be associated with increases in social maladjustment problems. These findings provide support for distinguishing between subtypes of both aggression and bullying behavior (i.e., physical and relational) in the developmental literature.

Keywords Relational aggression · Relational bullying · Early childhood · Social maladjustment problems

Introduction

Bullying behaviors are often associated with serious negative adjustment and health outcomes across development (for reviews see Cook et al. 2010; Halpern et al. 2015; Holt et al. 2015; Hong and Espelage 2012; Ttofi et al. 2011). Often the term “bullying” has been used interchangeably with “aggression” or “peer victimization” in prior studies, which may limit our ability to understand if there are unique

developmental consequences for children displaying bullying behaviors versus general aggressive behavior (Cornell and Limber 2015; Evans and Smokowski 2016).

As defined by the Centers for Disease Control and Prevention (CDC) bullying is intentional *aggressive behavior* that occurs within the context of a *power imbalance* and is *repeated* or has the strong possibility of repetition (Gladden et al. 2014). This definition is also in keeping with other scholarly writing on the topic (see Felix et al. 2011; Olweus 1993; Rodkin et al. 2015; Werth et al. 2015). Moreover, bullying is a subtype of aggression so all bullying behavior is aggression but theoretically not all aggression is bullying (Leff et al. 2010; Ostrov and Kamper 2015; Pepler et al. 2008; Rodkin et al. 2015). For example, aggression among equal status peers or friends would not typically qualify as bullying behavior as defined by bullying scholars (e.g., Cornell and Limber 2015; Ostrov and Kamper 2015; Pepler et al. 2008).

Aggression may be defined as the intent to hurt, harm or injure another person, which may manifest in physical or

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psychological harm (Eisner et al. 2015). More research is needed on relational aggression given that there is more extensive knowledge about physical forms (e.g., the use of physical force like hitting or kicking or the threat of physical harm to hurt or injure) of aggression and bullying relative to relational subtypes (Murray-Close et al. 2016). Relational aggression is defined as the removal or the threat of the removal of the relationship with the intent of harming another person (Crick and Grotpeter 1995) and is often displayed differently during early childhood relative to later periods in development, as the behaviors tend to be more direct, overt, and based on current circumstances (e.g., “You can’t come to my birthday party or play with me”) among 3–5-year-olds during early childhood. Further, among young children, the identity of the aggressor is usually known, which is less common when covert acts emerge later in development. For these reasons, relational aggression is well suited for study during early childhood when teacher-reports and observer-reports are frequently used to assess the behaviors (for review see Ostrov et al. 2018). Relational victimization is the receipt of relational aggression whereas physical victimization is the receipt of physical aggression (Crick and Grotpeter 1996). Finally, bullying may also manifest in physical or relational forms (e.g., Bradshaw et al. 2015; Gladden et al. 2014; Hong and Espelage 2012; Napoletano et al. 2016; Ostrov et al. 2015).

A central unanswered question within the developmental and applied literatures is if the inclusion of the bullying components of power imbalance and repetition add any value in the prediction of adjustment or health outcomes. There have been only a few known tests of this or related questions. Using a large sample of adolescents, Ybarra et al. (2014) concluded that perceptions of power imbalance and repetition were useful in identifying adolescents with particular daily functioning issues or notable levels of distress (e.g., depressive symptoms, self-esteem concerns, alcohol use). The authors further indicated that those that only experienced general peer victimization—not bullying—were also at increased risk for psychosocial adjustment problems (Ybarra et al. 2014). In addition, Felix et al. (2011) found students in early adolescence who experienced bullying (based on the aforementioned definition) reported problems with school connectedness and lower life satisfaction even compared to those that experienced general peer victimization not within the context of bullying. Despite these initial findings, there are still unanswered questions about the development and inclusion of bullying and bullying components in longitudinal research. In particular, relatively few studies have been conducted on the development of bullying behaviors among young children (cf. Ostrov et al. 2015; Rose et al. 2016; for review see Ostrov et al. 2017). Monks and Smith (2006) asserted that younger children might have trouble identifying the power

imbalance component of bullying as a negative aspect of social interactions. This idea is reflected in Hawley’s (1999) theoretical assertion that coercive strategies such as those reflected by a power imbalance, may be valued among young children and reduce some of the short-term social-psychological costs typically associated with peer aggression. Overall, we contend that we should first examine if there is utility in predicting short-term outcomes above and beyond the role of general peer aggression prior to conducting long-term longitudinal studies on bullying.

Prior research on links between aggression subtypes and peer victimization has been informed by the *social process model* (Boivin et al. 2001; Boivin and Hymel 1997). In part, this model posits a direct pathway between aggressive behavior and future peer victimization (Boivin and Hymel 1997) and specifically predicts that aggressors, often due to their peer status or problematic social interactions, increase the probability of experiencing future peer harassment. This model has been supported in several past studies in various developmental periods (e.g., Boivin et al. 2001; Giesbrecht et al. 2011; Ostrov 2008; Ostrov and Godleski 2013). Moreover, as mentioned, *resource control theory* suggests that power and social dominance may be valued during early childhood (Hawley 1999) and presumably should reduce the likelihood that those that engage in bullying behavior (i.e., aggression with power) experience retaliation or victimization. Conceivably those that are engaging in aggression without power and repetition may be using reactive functions of aggression that include negative affect and impulsivity; whereas those who are using aggression with power and repetition may be more premeditated, instrumental, or proactive in their display of aggression (Prinstein and Cillessen 2003). Theoretically, retaliatory or reactive functions of aggression have been associated with the frequent receipt of aggression in part because the negative affect that co-occurs with these types of aggressive behaviors may be reinforcing for aggressors and those prone to engaging in bullying (Salmivalli and Helteenvuori 2007). These effects have been found in prior studies, such that reactive functions of relational aggression were positively associated with increases in relational victimization; whereas proactive functions of relational aggression were associated with decreases in relational victimization (Ostrov et al. 2014).

The present study was designed to examine the utility of bullying subtypes within an early childhood sample and addresses the central question: Is general aggression different from bullying behavior? Thus, the present study was designed to test the unique predictive role of the components of bullying in an early childhood sample. Specifically, within a short-term longitudinal design, two versions of the same teacher report measure were used. The first version assessed general physical and relational aggression. The

second version contained the same items but added in the additional bullying components of *power imbalance* and *repetition*. The central aim was to test the differential associations between relational bullying and relational aggression in the prediction of changes in relational victimization during early childhood. Although the present study was focused on form and does not directly address the function of aggression the aforementioned past theory and literature is relevant for supporting the present study predictions. Specifically, we hypothesize that relational aggression, but not relational bullying (i.e., aggression with power) will be associated with increases in relational victimization over time.

Study 1

Method

Participants

This study included 124 children (M age = 44.88 months; SD = 4.52 months; 41.1% girls) from relatively diverse backgrounds (4.5% Asian/Pacific Islander/Indian, 3.4% Hispanic/Latino, 7.9% multi-racial, 1.1% other racial backgrounds, 61.8% White, and 21.3% unknown) who were part of an ongoing longitudinal study. The parental consent rate was 55% and parental occupation was obtained for approximately 70% of the sample via a parent reported family demographic form and was coded using Hollingshead's (1975) four-factor index 9-point scoring system (i.e., 9 = executives and professionals, 1 = service workers). The average occupation code was 8.3 (SD = 0.81), indicating that a typical family in the sample was from the second highest occupation group (i.e., 8 = Administrators, Lesser Professionals, Proprietors of Medium-Sized Businesses), which suggest the sample is, on average, middle to upper middle class. Children were recruited from 10 schools and 8 were accredited by the National Association for the Education of Young Children (NAEYC) at the time of the study (4 university/college affiliated, 5 community-based with religious affiliations but open to the community, and 1 cooperative nursery school). On average, teachers had been employed at the centers for 8.32 years (SD = 6.13 years). Teachers reported their highest earned credential and 24.9% had earned an associate degree or related credential, 31.3% had a bachelor's degree, and 43.8% earned a master's degree.

Across the two time points, which included a summer transition and many children leaving the centers for kindergarten, attrition was expected to be high and 31.5% of the sample left the study after time 1 (spring of year 1). This rate of attrition was anticipated given the initial age of the

children and as expected the vast majority of those that left the study transitioned to formal school (i.e., kindergarten) with a few having changed preschools or moved out of the area. This attrition resulted in the loss of 16 girls and 23 boys. The final sample with two time points of data was 85 children (41.2% girls). There was one significant attrition effect. Those that left the study had lower (M = 1.58; SD = 0.75) initial relational victimization values than those that stayed in the study (M = 2.01; SD = 0.82), $t(115) = 2.78$, $p = .006$, $d = .55$. Given the nature of the study aims this was not deemed to be particularly concerning although caution should be exercised when interpreting the overall findings from this study. There were no other significant differences on any of the initial study variables, $t(114) < 1.4$, p 's $< .16$, or demographics.

Procedure

The local university Institutional Review Board approved this study and parents of eligible children in participating preschools provided written consent. In addition, lead teachers provided consent prior to completion of teacher packets and were proportionally compensated for their participation based on the number of packets they completed. Teacher reports were distributed and completed at Time 1 (spring) and Time 2 (fall) with approximately 6 months between the conclusion of Time 1 and the beginning of Time 2. Most children transitioned to new classrooms during the summer between Times 1 and 2, which resulted in new teachers providing written consent and entering the study to complete teacher packets at Time 2. Participating schools and parents received a newsletter, which summarized findings.

Measures

Peer victimization Teachers completed a revised version (PPVM-TR-R; see Godleski et al. 2015) of the Preschool Peer Victimization Measure (PPVM-TR; Crick et al. 1999). The revised measure used in the present study contained 12 items, which represents four items for relational victimization (e.g., "This child gets told "you are not my friend/buddy" if they do not comply with a playmate's request"), and four items for physical victimization (e.g., "This child gets hit, kicked, or pinched by peers"). Four positively toned items measuring received prosocial behavior were not used in the present study. Teachers rated how frequently the focal child experienced relational or physical victimization on a 5-point scale from 1 (*never to almost never true*) to 5 (*always or almost always true*). Past research has demonstrated acceptable reliability for this measure (Godleski et al. 2015; Ostrov 2010; Ostrov et al. 2015). Teacher and research assistant reports have also been found to be

moderately correlated in past research (Ostrov et al. 2015). For the current study, Cronbach's α 's were 0.92 for relational victimization and 0.78 for physical victimization at Time 1 and 0.93 for relational victimization and 0.86 for physical victimization at Time 2.

General aggression

Relational and physical aggression were measured using the Preschool Proactive and Reactive Aggression (PPRA) scale (Ostrov and Crick 2007). The PPRA-Teacher Report (PPRA-TR) was originally based on the Forms and Functions of Aggression Measure (Little et al. 2003) and includes 14 items that assess aggressive behavior. Subscales include items to assess form and function of aggression as well as two positively toned filler items. Teachers in the current study completed this measure. In order to parallel the structure of the bullying assessment (see below) two subscales were created to represent relational aggression (6 items; e.g., "If other children hurt this child, s/he often keeps them from being in their group of friends"; "To get what this child wants, s/he often will ignore or stop talking to others") and physical aggression (6 items; e.g., "When this child is hurt by someone, s/he will often physically fight back," "This child often starts physical fights to get what s/he wants"). Teachers rated how frequently the focal child was relationally or physically aggressive on a 5-point scale from 1 (*never to almost never true*) to 5 (*always or almost always true*). Prior research has demonstrated good levels of internal consistency for these general aggression subscales (Ostrov et al. 2015) and teacher and research assistant reports have been moderately correlated in prior studies (e.g., Ostrov and Crick 2007; Ostrov et al. 2015). In the present study, Cronbach's α 's were good (0.92) for both relational aggression and for physical aggression.

Bullying subtypes

Teachers also completed a newly created rating instrument of bullying that expands on the PPRA scale (see above) originally developed by Ostrov and Crick (2007). This adapted measure, the Preschool Bullying Subscales Measure (PBSM; Ostrov et al. 2015), uses the CDC's uniform definition of bullying to add in the additional components of *power imbalance* and *repetition* to distinguish it from general aggressive behavior. The number of items and wording is designed to parallel the PPRA with the only modification being the inclusion of italicized phrases denoting power imbalance and explicitly emphasizing repetition. For example, the PPRA physical aggression item "This child often starts physical fights to get what s/he wants" was modified for the PBSM to "This child

repeatedly starts physical fights to get what s/he wants *from others with less power* (e.g., *smaller, younger, or has fewer friends*). In addition, the PPRA relational aggression item "To get what this child wants, s/he often will ignore or stop talking to others" was changed to "To get what this child wants, s/he *repeatedly* will ignore or stop talking to others with *less power* (e.g., *smaller, younger, or has few friends*)". In order to match the PPRA-TR in the present study the same 12 items (6 physical bullying and 6 relational bullying) were included and used in all analyses. Consistent with the prior study that used the PBSM, function (i.e., proactive and reactive) was not analyzed separately. To explore the internal structure of the measure, a principal axis factoring with promax rotation was conducted on the 12 items. Promax rotation was used given the hypothesized association between physical and relational forms of aggression. The scree plot suggested a two-component solution would be viable (eigenvalues for the components were 7.02, 2.43, 0.59, 0.48, 0.31, 0.28, 0.24, 0.21, 0.16, 0.13, 0.10, and 0.07). Factor loadings were all above .65 and items loaded on their hypothesized factors of either physical bullying or relational bullying. There were no cross-loadings on other factors. This analysis provides further justification for examining only the form of bullying in the present study. Prior research with this measure has demonstrated significant overlap between teacher and research assistant reports on this measure and acceptable past internal consistency. In the present study, both subscales had acceptable reliability (i.e., Cronbach's α = .93 for relational bullying and Cronbach's α = .95 for physical bullying).

Data Analyses

Preliminary analyses including bivariate correlations are followed by the use of hierarchical regression models to test key study hypotheses. Given conceptual and past empirical overlap as well as in keeping with related approaches in the field (Ostrov et al. 2014; see also Study 2, Table 1), gender, age, initial levels of both physical and relational victimization as well as physical victimization at Time 2 were entered at step 1. The outcome variable was relational victimization at Time 2.

Results

Preliminary analyses (see Table 1) suggested that there were no skew, kurtosis, or outlier issues to address. As anticipated, relational and physical victimization were moderately correlated at both time points. Relational bullying and relational aggression were highly correlated, but this was also anticipated as the same informant completed both

Table 1 Descriptive statistics and correlations among key study variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	M	SD	Range
1. Age	x	.09	.25*	.02	.34***	.13		.21*	.32***		.11	.13	.21*	-.03	.20	.15	46.78	7.47	35.00–63.00
2. RVicTRT1	-.04	x	.51***	.37***	.20	.79***		.32***	.59***		.31	.12	.33***	.01	.37***	.36***	2.06	0.86	1.00–4.25
3. PVicTRT1	.03	.53***	x	.09	.50***	.58***		.25*	.69***		.40***	.21*	.25*	-.02	.37***	.33***	1.70	0.72	1.00–3.25
4. RVicTRT2	-.15	.53***	.25*	x	.43***	.25*		.31**	.14		.22*	.04	.27***	-.24*	.27***	.24*	2.15	0.82	1.00–3.75
5. PVicTRT2	.02	.41***	.29*	.60***	x	.22*		.04	.41***		.23*	.17	.04	-.04	.19	.24*	1.80	0.70	1.00–3.50
6. RBullyTRT1	.11	.57***	.37***	.40***	.30**	x		.32**	.60***		.37***	.18	.36***	.15	.44***	.33**	1.85	0.85	1.00–3.50
7. RaggTRT1 (only Study 1)	.05	.77***	.48***	.60***	.39***	.84***	x												
8. RaggTRT1 (only Study 2)								x	.30*		.44***	.18	.98***	-.20*	.74***	.64***	2.03	0.86	1.00–4.17
9. PBullyingTRT1	.004	.36***	.58***	.24*	.36***	.45***	.44***		x		.58***	.46***	.32**	.08	.43***	.45***	1.67	0.93	1.00–4.33
10. PaggTRT1 (only Study 1)	.02	.32**	.63***	.19	.33**	.36***	.40***	.92***		x									
11. PaggTRT1 (only Study 2)											x	.55***	.45***	.01	.61***	.65***	1.57	0.82	1.00–4.67
12. PBullyingRAT1 (only Study 2)												x	.21*	.08	.35***	.40***	1.38	0.76	1.00–4.83
13. Relational SeverityRAT1 (only Study 2)													x	.00	.77***	.65***	0.00	0.81	-1.11–1.93
14. Relational DirectionalityRAT1 (only Study 2)														x	.05	-.05	0.00	0.58	1.36–1.28
15. Social Maladjustment RAT1 (only Study 2)															x	.88***	0.00	0.91	-1.01–2.38
16. Social Maladjustment RAT2 (only Study 2)																x	0.00	0.76	-1.04–1.86
M	44.88	1.87	1.50	1.24	1.06	1.59	1.82	1.35											
SD	4.52	0.82	0.54	0.57	0.39	0.76	0.80	0.62											
Range	35.64–61.12	1.00–4.00	1.00–3.00	1.00–3.00	1.00–3.00	1.00–4.00	1.00–4.00	1.00–4.00	1.00–3.83	1.00–4.33									

Study 1 is below the diagonal and Study 2 is above the diagonal

TR teacher report, RA research assistant report, RVicTRT1 relational victimization, PVicTRT1 physical victimization, RBullyTRT1 relational aggression, PBullyTRT1 physical aggression, RAT1 time 1, RAT2 time 2

* $p < .05$, ** $p < .01$, *** $p < .001$

measures. According to a Fisher r to Z transformation, relational aggression at Time 1 was significantly more highly correlated with both relational victimization at Time 1 ($Z = 6.23$, $p < .01$) and with relational victimization at Time 2 ($Z = 4.12$, $p < .01$) compared to the associations between relational bullying at Time 1 and relational victimization at Times 1 and 2, respectively.

The key hypothesis for Study 1—that there would be differential associations between relational aggression and relational bullying in the prediction of changes in relational victimization, with positive associations being present for relational aggression but not for relational bullying—was tested using a hierarchical regression (see Table 2, left column). In model 1, at step 1, the overall model was significant and there was stability for relational victimization from Time 1 to Time 2, which is across approximately 6 months (i.e., from spring of year 1 to fall/winter of year 2). At step 2, which accounted for about 6% of unique variance in the outcome, consistent with predictions only relational aggression was a unique predictor of increases in relational victimization. That is, controlling for relational aggression within the context of power imbalance (i.e., relational bullying), general relational aggression was uniquely associated with increases in relational victimization from peers.

Discussion

Consistent with adopted theory, Study 1 findings are notable because they demonstrate that despite overlap in the constructs, general relational aggression and relational bullying have discriminate associations with developmentally meaningful outcome variables. Despite several noted strengths there were considerable limitations with this study and replication is needed. First, it is the case that the general aggression items make reference to “often” engaging in the behavior and thus it may be that the general aggression measure also assesses for repetition without explicitly drawing attention to it as is the case for the bullying version of the measure. Nevertheless, a conservative interpretation is that the only key difference between the measures is the power imbalance component and even though some argue this is the central feature of bullying (e.g., Schumann et al. 2014), future studies will be needed to more appropriately manipulate the repetition component of the definition. Second, the level of attrition in the present study was anticipated given the transition to formal school for a large percentage of the participants but it along with the relatively low parental consent rate does raise some generalizability concerns and caution should be exercised in the interpretation of the findings. Third, the use of a single

Table 2 Regression models testing prospective relations between relational aggression, relational bullying, and relational victimization

Study 1					Study 2				
Outcome, step, & predictors	β	F , ΔF	R^2	ΔR^2		β	F , ΔF	R^2	ΔR^2
Model 1:					Model 2:				
RVict TR T2					RVict TR T2				
Step 1		(7, 68) = 11.04, $p < .001$.53		Step 1		(7, 77) = 8.49, $p < .001$.44	
Gender	.13				Gender	.08			
Age	-.11				Age	-.17			
PVict TR T1	-.02				PVict TR T1	-.52***			
RVict TR T1	.34**				RVict TR T1	.51***			
PVict TR T2	.54***				PVict TR T2	.58***			
PBully TR T1	.37				PBully TR T1	-.02			
Pagg TR T1	-.43				Pagg RA T1	.22*			
Step 2		(2, 66) = 4.95, $p = .01$.06		Step 2		(2, 75) = 2.16, $p = .12$.03	
RBully TR T1	-.16				RBully TR T1	.08			
Ragg TR T1	.56**				Ragg RA T1	.22+			

The only difference between the models for the two studies is that in Study 2, research assistant report of relational aggression and physical aggression (bolded in the table) is used to provide an independent informant. Additional models were run with physical victimization as the outcome variable and the effects were not significant

TR teacher report, RA research assistant report, RVict relational victimization, PVict physical victimization, RBully relational bullying, Ragg relational aggression, PBully physical bullying, Pagg physical aggression, T1 time 1, T2 time 2, Gender coded: 1 = boy, 2 = girl

+ $p = .054$, * $p < .05$, ** $p < .01$, *** $p < .001$. The correlation between step 2 predictors in Study 1 was .82, $p < .001$ and .32, $p = .002$ in Study 2

informant (i.e., teacher report) raises shared-method variance and collinearity issues. The correlation between relational bullying and relational aggression at Time 1 was high and even though the variance inflation factor and tolerance statistics did not suggest a problem, the interpretation of the findings may still be problematic. Thus, in the second study a methodological approach was adopted that creates variables that represent the uncorrelated sum and difference scores to represent total amounts of aggression and a likelihood to engage in one type of aggression relative to another (i.e., bullying relative to general aggression; see Park et al. 2005). Finally, in an effort to test the clinical utility of this approach and to further provide evidence for the discriminate associations for these constructs we tested prospective links with social maladjustment problems.

In Study 2 we have several hypotheses. We hypothesize that the overall effect from Study 1 will be replicated as indexed by a positive association between research assistant reported relational aggression and changes in teacher reported relational victimization. Moreover, we hypothesize that relational directionality (i.e., use of relational aggression vs. relational bullying), but not severity (i.e., high relational aggression and bullying) will be significantly associated with increases in relational victimization. That is, we predict that a preponderance of relational aggression relative to relational bullying will be associated with increases in relational victimization. We predict similar effects when examining associations with social maladjustment problems. Specifically, we hypothesize that relational severity will not be associated with changes in social maladjustment, but relational directionality will be a negative predictor of social maladjustment problems. That is, we predict that a preponderance of relational aggression relative to relational bullying will be associated with increases in social maladjustment problems.

Study 2

Method

Participants

This study included 105 participants (M age = 46.78 months, SD = 7.47 months; 52.4% girls) from relatively diverse backgrounds (5.8% African American, 8.7% Asian/ Pacific Islander/ Indian, 3.8% Hispanic/Latino, 13.5% multi-racial, 66.3% White, and 1.9% unknown). The parental consent rate was 78.67%. Parental occupation was obtained at enrollment from 99% of the families and was coded using Hollingshead's (1975) four-factor index 9-point scoring system (see Study 1). Values ranged from 2 to 9 with a 7.31 average (SD = 2.04), indicating that a typical

family in the sample was from the third highest occupation group (i.e., 7 = small business owners, farm owners, managers, minor professionals), which suggests the sample is on average, middle class. Children were recruited from 5 of the 10 schools that participated in Study 1 and all were NAEYC accredited (4) or recently accredited (1) at the time of the study (4 university/college affiliated, 1 community-based with religious affiliation but open to the larger community). On average, teachers had been employed at the centers for 5.72 years (SD = 5.68 years). Teachers reported their highest earned credential and 27.2% had earned an associate degree or related credential, 27.3% had a bachelor's degree, 36.4% earned a master's degree, and 9.1% reported earning an additional graduate degree.

Across the two time points—fall and spring—attrition was low (10.5%, 6 girls and 5 boys) and was due to children changing schools or families moving out of the area. There were no significant differences between those that had complete data and those that left the study on any key study variable, t 's(101) < 1.5, p 's > .13.

Procedure

The local institutional review board (IRB) approved the study. Parental consent forms were distributed to families at the beginning of the school year. There was approximately a two and a half month period of time between the first and second data collection time points. Research assistants (RA) completed standard teacher report instruments to report on children's behaviors (i.e., research assistant reports) at the end of both observation data collection periods. At the end of observations in the fall and spring, teachers also provided consent to participate in the study and were compensated with gift cards for their participation in completing child questionnaires. Parents and schools were also provided newsletters summarizing the key findings.

Measures

Teacher report *Peer victimization*: Teachers completed the same peer victimization measure (PPVM-TR-R) as reported in Study 1. For Study 2, Cronbach's α 's were 0.88 for relational victimization and 0.88 for physical victimization at Time 1 and 0.90 for relational victimization and 0.87 for physical victimization at Time 2.

Bullying subtypes: Teachers completed the same bullying subtype measure (PBSM) as reported in Study 1. In Study 2, both subscales had acceptable reliability (i.e., Cronbach's α = .93 for relational bullying and Cronbach's α = .95 for physical bullying). In further support of the validity of this measure, teacher reports and research assistant reports of PBSM were collected and were moderately correlated (e.g., for relational bullying at Time 1, r = .38, p < .05).

Similar to Study 1, to explore the internal structure of the measure, a principal axis factoring with promax rotation was conducted with the 12 items. The scree plot suggested a two-component solution would be viable (eigenvalues for the components were 8.50, 1.28, 0.44, 0.38, 0.33, 0.30, 0.22, 0.15, 0.15, 0.12, 0.07, and 0.04). Factor loadings were all above .60 and items loaded on their hypothesized factors. There were no cross-loadings on other factors.

Research assistant report Research assistants spent a significant amount of time in the classrooms (approximately 9 h per week for 2–3 months each semester) conducting naturalistic observations of aggression, victimization and other social behaviors (see Godleski et al. 2015). Observers were rigorously trained using readings and video observation discussion, practice observations using six standard observations sessions, and vignette tests (see Ostrov and Keating 2004). After completion of the classroom observations, one of the observers in the classroom was selected to complete a series of questionnaires on individual children as they had ample time to observe behavior within the classroom. Importantly, research assistants only completed questionnaires on children that they had spent substantial time observing. As previously mentioned, teacher and research assistant reports show moderate associations and have been used in the past to assess both social behaviors (e.g., aggression, bullying) as well as social-psychological adjustment (Kamper-DeMarco and Ostrov 2017). Unlike Study 1, RA reports were used to provide an independent informant in models predicting teacher report of victimization.

General aggression: RA reports of general aggression were obtained using the PPRA, which is described in Study 1. In Study 2, both subscales of the PPRA-RA had acceptable reliability (i.e., Cronbach's $\alpha = .95$ for relational aggression and Cronbach's $\alpha = .95$ for physical aggression).

Bullying subtypes: RA reports of bullying were assessed using the PBSM and were used in the calculation of the relational severity and relational directionality variables (see below). The PBSM was described in Study 1. In Study 2, both subscales had acceptable reliability (i.e., Cronbach's $\alpha = .95$ for relational bullying and Cronbach's $\alpha = .94$ for physical bullying).

Creation of severity and directionality variables: In keeping with procedures outlined in Park et al. (2005, p. 239; see also Essex et al. 2003), first standardized scores were created, thus yielding standardized research assistant reported relational bullying (Z_{RB}) and research assistant reported relational aggression (Z_{RA}) variables. Next, relational severity was calculated by averaging the standardized scores $[(Z_{RB} + Z_{RA})/2]$, where high levels on this continuous variable represent being high on both relational aggression

and relational bullying and low scores represent being low on both constructs (Park et al. 2005, p. 239). Severity scores represent what the two constructs share (i.e., characteristics not unique to relational bullying or relational aggression, Park et al. 2005, p. 239). Finally, relational directionality is the standardized half difference between relational bullying and relational aggression $[(Z_{RB} - Z_{RA})/2]$ with positive values representing a prevalence of bullying relative to aggression and negative scores representing a prevalence of aggression relative to bullying behaviors (Park et al. 2005, p. 239). Directionality reflects what distinguishes the two constructs and represents unique characteristics to relational bullying or relational aggression (Park et al. 2005, p. 239). In the past, this approach has eliminated issues of collinearity, the resulting variables have zero means and are uncorrelated, and the method has yielded interesting insights into the development of aggression subtypes and psychopathology among children (Essex et al. 2003; Park et al. 2005). Previously, this approach was used to address the co-occurrence of child behavior problems as well as relational and physical aggression where the association was large (e.g., $r = .86$ for internalizing and externalizing behavior; Essex et al. 2003; Park et al. 2005).

Social maladjustment problems: A social maladjustment composite using RA reports was created to measure broadband social maladjustment problems. Teacher reports of social maladjustment were not available for all components and thus only RA reports of social maladjustment were used. Prior literature has demonstrated that hyperactivity is one component of externalizing behavior problems and shows links between relational aggression and Attention Deficit Hyperactivity Disorder features in middle childhood (e.g., Zalecki and Hinshaw 2004). In addition, deception and lying are conceptualized to be early indicators of conduct problems (Loeber et al. 2009), which are part of the social maladjustment problem behavior spectrum. Past research has also found links between relational and physical aggression and deception/lying behaviors in early childhood (e.g., Ostrov 2006). Moreover, peer rejection is consistently associated concurrently and prospectively with externalizing and adjustment problems like hyperactivity and aggression among children and youth (e.g., Coie et al. 1995; Mikami and Hinshaw 2006; Tseng et al. 2014). Bierman (2004) argues that although there is no single profile for the typical rejected child, "rejected children often display disruptive and oppositional behaviors that reflect difficulties in regulating emotions effectively and maintaining positive interpersonal relationships" (p. 21). Thus, there is conceptual justification for including peer rejection with hyperactivity (i.e., disruptive) and deception (i.e., oppositional) in a social maladjustment composite. In keeping with this conceptual approach, prior research during early adolescence has combined peer rejection,

lying/cheating, and disruptive behavior into an antisocial-rejected composite (French et al. 1995). In addition, prior evidence from factor analyses suggests similar constructs (i.e., social skills, popularity/peer rejection, and externalizing behavior) load on one social functioning factor among preschool children (Liew et al. 2004). Therefore, in keeping with this literature and to reduce the number of models being tested we create an overall composite of social maladjustment problems in Study 2.

At Time 1 the composite was comprised of deception/lying and peer rejection. At Time 2, hyperactivity, unavailable in the study at Time 1, was added to the composite in order to broaden the scope of social maladjustment problems assessed within the study and to include a more traditional index of externalizing problems in the composite. Deception/lying was measured using the 7 item deception subscale (e.g., “To obtain another’s compliance, s/he uses false statements,” “S/he uses deception to manipulate her/his peers during play”) of the Children’s False Statement-Observer Report (Ostrov 2006), peer rejection was measured using the two item peer rejection subscale (e.g., “This child is disliked by peers of the same sex”) of the Preschool Social Behavior Scale (e.g., Ostrov 2008), and hyperactivity was measured using the 4 item hyperactivity/distractibility subscale (e.g., “Restless. Runs about or jumps up and down. Doesn’t keep still”) of the Child Behavior Scale (Ladd and Proffitt 1996). Each measure was standardized and then an overall average was created. The composite without hyperactivity demonstrated excellent reliability at Time 1 (i.e., Cronbach’s $\alpha = .95$) and Time 2 (i.e., Cronbach’s $\alpha = .94$) and maintained excellent reliability at Time 2 with hyperactivity (i.e., Cronbach’s $\alpha = .95$). In addition, each component was moderately correlated with one another—hyperactivity was moderately correlated with concurrent deception/lying ($r = .37$, $p < .001$) and peer rejection ($r = .43$, $p < .001$); deception/lying was moderately correlated with concurrent peer rejection ($r = .44$, $p < .001$)—providing further support for the use of the social maladjustment problems composite. These values are consistent with or higher than those reported in prior research that adopted a similar composite strategy (e.g., French et al. 1995). In addition, the association between the Time 1 composite with Time 2 composite (which included hyperactivity) was high (see Table 1) which supports the present approach.

Results

Preliminary analyses (see Table 1) indicated that there were no skew, kurtosis, or outlier issues to address. As anticipated, teacher reported relational and physical victimization were moderately correlated at both time points. The

association between research assistant reported relational aggression and teacher reported relational bullying was attenuated relative to similar correlations with teacher reports found in Study 1, $r = .32$, $p < .01$. Given conceptual and empirical overlap with central variables in the study age, gender, and initial levels of physical aggression and physical victimization were controlled in all models (see Table 1 for bivariate associations).

The first aim of Study 2 was to replicate the overall effect of Study 1, while reducing the collinearity and shared method variance concerns by using research assistant reports of relational aggression and teacher reports of relational bullying. Hierarchical regression models consistent with Study 1 were conducted and use of research assistant reports of relational aggression (and teacher reported relational bullying) presumably made it more difficult to support our hypothesis (see Table 2). In model 2, at step 1, there is again evidence of moderate levels of stability for relational victimization. At step 2, using independent informants, the findings were generally consistent with predictions given that only research assistant reported relational aggression tended ($p = .054$) to be significantly associated with increases in relational victimization across the academic year.

In an effort to further test the key study hypotheses and reduce collinearity and shared method variance concerns a third model was run in which the step 2 predictor variables were relational severity and relational directionality. In the model, research assistant report was used to create the relational severity and directionality variables and the same teacher reported relational victimization at Time 2 variable was retained. In model 3 (see Table 3), at step 2, there was an unanticipated significant effect indicating that those that were high on severity (i.e., high on both aggression and bullying behavior) had an increase in relational victimization. In addition, at step 2, there was a significant negative effect for relational directionality. That is, a preponderance of research assistant reported relational aggression relative to relational bullying was associated with increases in teacher reported relational victimization.

The final aim of Study 2 was to further examine the utility and implications of the severity and directionality approach in predicting social maladjustment problems. At step 1 of model 4 (see Table 4), gender, age, initial levels of social maladjustment, as well as physical bullying and physical aggression at Time 1 were entered. In model 4, there was a high degree of stability for social maladjustment problems. There was no significant effect for relational severity at step 2. However, there was a nonsignificant negative trend for relational directionality. A prevalence of relational aggression relative to relational bullying was associated with future social maladjustment problems like hyperactivity, lying, and peer rejection. Given that initial levels of hyperactivity were

Table 3 Regression models testing prospective associations between research assistant reported severity and directionality and changes in teacher reported relational victimization (Study 2)

Outcome, step, & predictors	β	$F, \Delta F$	R^2	ΔR^2
Model 3: RVict TR T2				
Step 1		(7, 82) = 9.26, p < .001	.44	
Gender	.09			
Age	-.14			
PVict TR T1	-.52***			
RVict TR T1	.48***			
PVict TR T2	.58***			
PBully RA T1	-.13			
Pagg RA T1	.29**			
Step 2		(2, 80) = 4.49, p = .014	.06	
Relational severity RA T1	.22*			
Relational directionality RA T1	-.19*			

Severity is the average Z score of the relational bullying and relational aggression variables. Directionality is the standardized half difference between relational bullying and relational aggression with positive values representing a prevalence of bullying relative to aggression and negative scores representing a propensity for aggression relative to bullying behaviors (see text). Additional models were run with physical victimization as the outcome variable and the effects were not significant.

TR teacher report, RVict relational victimization, PVict physical victimization, PBully physical bullying, Pagg physical aggression, RA research assistant reported, T1 time 1; Gender coded: 1 = boy; 2 = girl

* p < .05, *** p < .001

not available in the study a final post-hoc prospective model was run with just a deception/lying and peer rejection social maladjustment problems composite as the outcome variable. Relational severity was a significant positive predictor of social maladjustment (β = .24, p = .003), whereas relational directionality continued to be a marginally significant negative predictor (β = -.10, p = .08, ΔR^2 = .035) of social maladjustment. Thus, a preponderance of relational aggression relative to relational bullying tended to be associated with increases in the lying and peer rejection composite. Although different individuals at the two time points likely completed the RA reports, caution should be used in the interpretation of model four and the post-hoc model because in order to be consistent with variable selection in the prior models both the predictors and outcome were from research assistant reports.

Discussion

Study 2 provided replication for the overall effects found in Study 1, but did so with a more conservative test of the

Table 4 Regression models testing prospective associations between relational severity and directionality and changes in social maladjustment problems (Study 2)

Outcome, step, & predictors	β	$F, \Delta F$	R^2	ΔR^2
Model 4: Social Maladjustment RA T2				
Step 1		(5, 88) = 99.96, p < .001	.84	
Gender	-.05			
Age	.003			
Social Maladjustment RA T1	.81***			
PBully RA T1	.04			
Pagg RA T1	.14*			
Step 2		(2, 86) = 1.71, p = .19	.006	
Relational severity RA T1	.02			
Relational directionality RA T1	-.08+			

Social maladjustment in model 4 includes hyperactivity, peer rejection, and deception/lying at Time 2 but only peer rejection and deception/lying at Time 1. The stability from Time 1 to Time 2 for social maladjustment was high (r = .88, p < .001, see Table 1). See the text for a post-hoc prospective model without hyperactivity.

RA research assistant reported, PBully physical bullying, Pagg physical aggression, T1 time 1, T2 time 2, Gender coded: 1 = boy; 2 = girl

+ p < .08, * p < .05, *** p < .001

model. Initially, a different informant was used for relational aggression relative to relational bullying and model 2 extended the findings from model 1 of Study 1 by demonstrating that the pattern of effects generally held even with a more rigorous test of the hypothesis. In an effort to further overcome Study 1 limitations and address collinearity concerns, two new variables were created that reflected severity and directionality of relational behaviors. The findings were replicated indicating that a propensity to engage in relational aggression relative to relational bullying was associated with increases in relational victimization. However, in contrast to predictions, relational severity (i.e., those high on both relational aggression and relational bullying) was associated with increases in relational victimization. This effect warrants replication but suggests that those that engage in high levels of both aggression and bullying are likely to experience peer and other social maladjustment problems. Finally, in an effort to establish the initial clinical utility of the adopted approach, two additional models were run in which it was found that relational directionality tended to be negatively associated with changes in a social maladjustment problems composite. This composite included hyperactivity, lying/deception, and peer rejection. Thus, a preponderance of relational aggression relative to relational bullying tended to be associated with increases in these adjustment problems. When only peer rejection and deception were used in the

follow-up post-hoc prospective model, it was also revealed that relational severity or those high on both aggression and bullying was significantly associated with increases in social maladjustment. The shared component of these behaviors is likely the intention to harm others and those that engage in high levels of harmful behaviors appear to be at risk for social and peer difficulties during early childhood.

Study 2 had a number of strengths including a measurement approach designed to address collinearity concerns. In addition, this study was designed to provide important information about links between relational aggression and relational bullying and key adjustment behaviors that have implications for school-readiness and overall well-being. However, there are notable limitations including the relatively short interval between the two time points. In addition, unlike Study 1, the same teacher completed ratings of peer victimization at both time points. Further, it is still the case that the general aggression items make reference to “often” engaging in the behavior and thus future studies are still needed to more appropriately manipulate the repetition component of the definition. RA reports were used for both predictors and outcomes in the final model raising shared method variance concerns. Finally, initial hyperactivity data was not available so a true prospective model was not tested. Although, when hyperactivity at Time 2 was removed the overall prospective adjustment model yielded similar findings with regard to directionality.

General Discussion

The goal of the current study was to examine the differential effects of relational bullying and aggression in early childhood using a short-term longitudinal design. Results suggested that relational aggression, but not relational bullying, was predictive of increases in relational victimization. Aggressive behavior without a power imbalance may increase vulnerability for retaliation or perhaps these behaviors occur in a more submissive context and thus place children at risk for peer harassment. Moreover, it may be that aggression without power is more in keeping of reactive functions of aggression, which are known to be predictive of peer victimization (e.g., Ostrov et al. 2014). Future research will be needed to explicitly test models in which the functions of aggression are included to more precisely support these theoretical assertions. Results were replicated when using statistical methods that address collinearity concerns and extended to more clinically relevant outcomes such that a higher likelihood of using relational aggression relative to relational bullying was predictive of increases in social maladjustment problems.

Limitations and Future Research Directions

These findings highlight the differential influence of relational aggression and relational bullying on subsequent negative behavior and as such, continued research is needed. Although these findings hold across the course of a school year (Study 2) and from one year to the next (Study 1), it will be important to examine longer periods of time with multiple waves to better understand how these associations develop over time as children’s understanding of bullying behavior becomes more complex or interpreted negatively. Future work should examine more outcome variables such as internalizing behavior (e.g., depression, anxiety) and academic abilities in order to better understand how relational aggression and bullying behavior affect adjustment variables across multiple domains in early childhood. It would also be interesting to know whether these outcomes are consistent across gender while examining both physical and relational forms of aggression and bullying to determine if there are different mechanisms at play for boys and girls. It is important to note that the present findings are not suggesting that relational bullying is not associated with any negative consequences. In fact, the bivariate associations reveal moderate associations between relational bullying and concurrent and future social maladjustment problems. Moreover, the relational severity findings seem to indicate that those high in both general aggression and bullying behavior may be particularly at risk for future social and peer difficulties. Future work should also expand how power imbalance is operationalized as it was relatively limited to size, age, and social network size in the present studies and there are numerous ways to measure abuse of power and power relationships (Schumann et al. 2014).

The present research was motivated by a key question: Is there a difference between general aggression and bullying behavior constructs? The present findings demonstrate the utility of the bullying definition and support the notion that there are reliable differences between general aggression and bullying behavior constructs (Ostrov and Kamper 2015). In general, the present findings suggest that future research should continue to examine general aggression and bullying as separate constructs to better understand their development as well as the specific developmental trajectories they may be associated with. However, the findings also indicate that there may be some situations when the shared components of bullying and aggression may exacerbate risk and future research is needed to more carefully isolate the particular components and mechanisms involved in those developmental processes. Furthermore, although current practices and social policies are aimed at reducing or preventing bullying, this study supports that while there is certainly good reason to pay attention to

bullying, research and intervention efforts should also continue to examine and address general peer aggression among young children as there are also negative consequences associated with these behaviors for the aggressor and their victims.

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Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee at the University at Buffalo, The State University of New York and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study. Prospective associations between aggression/bullying and adjustment in preschool: Is general aggression different from bullying behavior?

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